

METHOD FOR THE INTERFERENCE-FREE COMMUNICATION DURING THE OPERATION OF A JAMMING TRANSMITTER

Field of the Invention

- 0001 The invention relates to a method for the interference-free communication between participants of a communication system located within the operating range of a jammer and/or jamming transmitter.

Background of the Invention

- 0002 For the non-lethal destruction of targets, explosive-driven RF (radio frequency) generators are used in addition to high-power microwave sources (HPM). The electronic components of a target are thus destroyed through the target-aimed transmission of RF rays or the operation is interfered with through dazzling or jamming, without destroying the target itself. A radiation source of this type is disclosed in reference DE 199 59 358 A1.
- 0003 The problem with this type of approach is that it also interferes with the communication between participants of friendly communication systems if these are located within transmitting range of the jamming transmitter and the frequency range covered by the jamming transmitter. Shifting to frequency ranges outside of the range covered by the jamming transmitter is not the best solution as this requires new transmitting and receiving equipment. In addition, the ranges can be severely restricted for higher frequencies, for example as a result of damping, etc.

Summary of the Invention

- 0004 It is therefore the object of an embodiment of the present invention to specify a method which makes it possible to have communication within friendly communication systems despite the operation of a jammer and/or jamming transmitter. Embodiments of the invention designed to secure communication during the operation of UWB (ultrawide) broad-band jamming transmitters.
- 0005 From the telecommunications field, it is known that a time window for transmission and reception is assigned to a mobile telephone which logs onto a base station. For this, data is transmitted in compressed form at specific time intervals, which are agreed upon by transmitter and receiver. The base station automatically assigns the time window, which is detected by the mobile telephone. A so-called communication chip can be self-programmed to perform these functions.
- 0006 Embodiments of the invention are based on the idea of providing the participants of a communication system with so-called time windows for the communication between participants and their transmissions during the operation of a friendly jammer, similarly as for a mobile telephone. These time windows are specified ahead of time in the communication system, e.g. with the aid of the jamming transmitter, or are individually created and/or adapted for the short term with the aid of software programs. Since only the communicating participants know and/or recognize these time windows, they are the only ones to receive and/or transmit corresponding data during these time windows. The data are compressed in a known manner, so that they can be transmitted and received as a whole during the short period assigned to the time windows.

During the jamming operation, these data can then be decompressed and read out in the same manner.

- 0007 Friendly forces are thus provided with the option of maintaining radio communication in the frequency range of the jamming transmitter through modification of the transmitting and receiving behavior in time.
- 0008 The time windows in the time period used for friendly communication are preferably created through synchronizing the jamming signal and the transmitting signal in time, which cannot be anticipated and therefore can also not be utilized by the communication systems to be jammed. Friendly communication systems transmit the data with a type of time compression and the synchronization ensures that friendly communication systems, which are attuned in time to the transmitted jamming pattern agreed upon with the jamming transmitter, can continue to communicate with each other.
- 0009 The jamming transmitter can transmit a fixed, repetitive interference pattern with high pulse repetition rate, wherein the participants of a friendly communication system analyze the progression in time and then transmit during the provided time gaps. The communication participants of the friendly communication system preferably inform each other of these time gaps, so that the participants can receive and transmit signals during the time gaps provided for the friendly transmission.
- 00010 According to another option, the jamming transmitter contacts the other communication participants prior to the start of the transmission of the interference pulse and coordinates these time gaps with the other participants.

00011 One advantage of this embodiment of the invention is that existing transmitting frequencies with known ranges can continue to be used. In addition, the interference pattern can be modified at any time to ensure that enemy communication systems are jammed.

00012 The synchronizing with the jamming transmitter can be achieved with an additional module and/or through modification of a communication chip installed in a friendly communication participant. Communication chips of this type are programmable, are known from the mobile phone technology and are used, for example, in devices by the companies Motorola, Ericsson or Siemens.

Brief Description of the Figures

00013 The method is to be explained briefly with the aid of a diagrammatic representation; wherein the Figure is a schematic diagram of a communication system.

Detailed Description of the Preferred Embodiment

00014 A first communication system is formed by several communication participants 1.1, 1.2, 1.3 (to 1.n) which are located inside a building/house 11 or in an outside area, shown herein, while additional, enemy communication devices 2.1, 2.2, 2.3 (to 2.n) form a second communication system. A jamming transmitter with reference 10 operates within the range of both the first and second communication systems and belongs to the first communication system.

00015 The jamming transmitter 10, an UWB (ultrawide) broadband jamming transmitter, transmits a short pulse, (for example a pulse with a pulse width ~ 1 ns, with a pulse repetition rate of several MHz, which for the first and second communication systems leads to a noise level that is clearly

above the actual signal level. Thus, reception by the first and second communication systems is not possible within the range of the jamming transmitter.

- 00016 By omitting interference pulses or variations in the pulse repetition rate in the interference pattern of the jamming transmitter 10, time windows are created for friendly communication within the first communication system, which cannot be anticipated by the enemy communication system.
- 00017 Synchronizing and/or adapting the transmitting/receiving frequencies between the jamming transmitter 10 and friendly communication participants 1.1, 1.2, 1.3 to these interference windows of the jamming transmitter 1 creates the option of communication in the friendly system and can be realized by means of a supplemental component 1.11, 1.21, 1.31 and/or a modification using a communication chip in the friendly communication participants 1.1, 1.2, 1.3.
- 00018 In addition, the friendly data are compressed in the smaller time window as compared to normal communication. This can be achieved, for example, through increasing the clock frequency and/or the transmission band width. For example, a signal with a band width of 5 kHz and a time length of 1 μ s is then transmitted with a band width of 50 kHz and a time length of 100 ns.
- 00019 The participants of the friendly communication systems 1.1, 1.2, 1.3 are advantageously connected to the antenna only during the time window specified for the transmission, thus making it possible to avoid overdrives caused by the jamming transmitter 10. The participants are preferably connected and/or disconnected with the aid of a switch that is triggered with the coding which is also used to determine the time windows.